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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/803,411	03/18/2004	Colin N. Gunn	6270/138	5554

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EXAMINER

BARAN, MARY C

ART UNIT PAPER NUMBER

2857

DATE MAILED: 09/27/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

44

Office Action Summary

Application No.

10/803,411

Applicant(s)

GUNN ET AL.

Examiner

Mary Kate B. Baran

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
 Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 23 May 2005.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-58 is/are pending in the application.
- 4a) Of the above claim(s) 28-48 and 54-58 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-18, 20, 21, 24-27 and 49-53 is/are rejected.
- 7) ☒ Claim(s) 19, 22 and 23 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 18 March 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>6/10/04; 10/1/04; 5/</u> | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Election/Restrictions

1. Restriction to one of the following inventions is required under 35 U.S.C. 121:
 - I. Claims 1-27 and 34-58, drawn to an apparatus for sensing the current in a power line of a power system, classified in class 702, subclass 64.
 - II. Claim 28, drawn to a system for monitoring individual loads on a power system feeder, classified in class 361, subclass 52.
 - III. Claim 29, drawn to a system for monitoring at least one power parameter in a power line, classified in class 702, subclass 61.
 - IV. Claims 30-33, drawn to a method of metering the power importation and power exportation of an independent power producer, classified in class 702, subclass 61.

The inventions are distinct, each from the other because of the following reasons:

2. Inventions I and II are related as subcombinations disclosed as usable together in a single combination. The subcombinations are distinct from each other if they are shown to be separately usable. In the instant case, invention I has separate utility such as sensing the current in a power line. Invention II recites an intelligent electronic device which senses current flow to monitor a load, the system recited in Invention II could use any current input, and still monitor loads on a power feeder system. See MPEP § 806.05(d).

3. Inventions I and III are related as subcombinations disclosed as usable together in a single combination. The subcombinations are distinct from each other if they are shown to be separately usable. In the instant case, invention I has separate utility such as sensing the current in a power line. Invention III recites an intelligent electronic device which uses a current input to monitor power. The system recited in Invention II could use any current input and still monitor a power parameter. See MPEP § 806.05(d).

4. Inventions I and IV are related as subcombinations disclosed as usable together in a single combination. The subcombinations are distinct from each other if they are shown to be separately usable. In the instant case, invention IV has separate utility such as a method or power metering. Invention IV discloses an intelligent electronic device which is then coupled to a current sensor for power metering. Invention I does recite a current sensor, however, Invention IV simply recites a current input, and with this current input, can still monitor the power. See MPEP § 806.05(d).

5. This application contains claims directed to the following patentably distinct species of the claimed invention I:

- A. The species best illustrated by Figure 2.
- B. The species best illustrated by Figure 3.
- C. The species best illustrated by Figure 4.

Applicant is required under 35 U.S.C. 121 to elect a single disclosed species for prosecution on the merits to which the claims shall be restricted if no generic claim is finally held to be allowable.

Applicant is advised that a reply to this requirement must include an identification of the species that is elected consonant with this requirement, and a listing of all claims readable thereon, including any claims subsequently added. An argument that a claim is allowable or that all claims are generic is considered nonresponsive unless accompanied by an election.

Upon the allowance of a generic claim, applicant will be entitled to consideration of claims to additional species which are written in dependent form or otherwise include all the limitations of an allowed generic claim as provided by 37 CFR 1.141. If claims are added after the election, applicant must indicate which are readable upon the elected species. MPEP § 809.02(a).

Should applicant traverse on the ground that the species are not patentably distinct, applicant should submit evidence or identify such evidence now of record showing the species to be obvious variants or clearly admit on the record that this is the case. In either instance, if the examiner finds one of the inventions unpatentable over the prior art, the evidence or admission may be used in a rejection under 35 U.S.C. 103(a) of the other invention.

6. During a telephone conversation with Sanders Hillis on 1 September 2005 a provisional election was made with traverse to prosecute the invention of sensing the

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current in a power line, claims 1-27 and 49-53. Affirmation of this election must be made by applicant in replying to this Office action. Claims 28-48 and 54-58 are withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

Specification

7. The disclosure is objected to because of the following informalities:
- (a) On page 1 paragraph [0003] line 1, the U.S. Provisional Patent Application Serial Number has been left blank.
 - (b) On page 10 paragraph [0050] line 5, "thorough" should be – through –.
 - (c) On page 10 paragraph [0050] line 6, "switches" should be – switch –.
- Appropriate correction is required.

Claim Rejections - 35 USC § 102

8. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-18, 20, 21, 24-27 and 49-53 are rejected under 35 U.S.C. 102(b) as being anticipated by Bullock (U.S. Patent No. 5,066,904).

Referring to claims 1 and 49, Bullock teaches an apparatus for sensing the current in a power line of a power system (see Bullock, column 1 lines 9-12), the

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apparatus comprising: an enclosure providing a window operable to permit the passage of said power line therethrough (see Bullock, column 7 lines 22-26); an active current transformer set within said enclosure and operative to produce a scaled version of said current (see Bullock, column 7 lines 39-44); an amplifier coupled with said active current transformer and operative to reduce the phase shift and ratio error between said current and said scaled version of said current (see Bullock, column 5 lines 35-42); a powering current transformer set within said enclosure and operative to receive power from said power line on a primary winding and deliver power on a secondary winding (see Bullock, column 7 lines 45-52); power supply circuitry set within said enclosure, said power supply circuitry powered through said secondary winding from said powering current transformer and operative to supply power to said amplifier (see Bullock, column 7 lines 53-65); and at least one of secondary leads and secondary terminals extending from said enclosure, coupled with said active current transformer and operative to deliver said scaled version of said current outside of said enclosure (see Bullock, Figure 3); and power supply circuitry set within said enclosure, said power supply circuitry operative to extract power flowing within a second range of frequencies through said at least one of secondary leads and secondary terminals, said power supply circuitry operative to supply power to said amplifier (see Bullock, column 17 line 56 – column 18 line 9).

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Referring to claim 2, Bullock teaches a burden set within said enclosure and coupled across said at least one of secondary leads and secondary terminals (see Bullock, column 17 lines 15-25).

Referring to claim 3, Bullock teaches that said amplifier is configured so that the absolute value of said phase shift is below 0.05 degrees when said apparatus is operated over a dynamic range of 50 to 1 of said current to said scaled version of said current (see Bullock, column 5 lines 35-42).

Referring to claim 4, Bullock teaches that said amplifier is configured so that the ratio error is below 0.1% when said apparatus is operated over a dynamic range of 50 to 1 of said current to said scaled version of said current (see Bullock, column 5 lines 35-42).

Referring to claim 5, Bullock teaches that said amplifier is configured to generate a compensation current which zeros the flux in a sense coil within said active current transformer (see Bullock, column 8 lines 2-6).

Referring to claim 6, Bullock teaches a secondary coil within said active current transformer (see Bullock, column 7 lines 59-61); a current divider coupled to said secondary coil (see Bullock, column 8 lines 54-59); wherein said current divider is

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configured to feed a portion of said compensation current into said secondary coil (see Bullock, column 8 lines 2-6).

Referring to claim 7, Bullock teaches a shunt coupled with said secondary winding and operative to carry at least a portion of an output current of said secondary winding (see Bullock, column 7 lines 15-20).

Referring to claim 8, Bullock teaches a regulator coupled with said shunt and operative to regulate the flow of current through said shunt (see Bullock, column 9 lines 24-32).

Referring to claims 9-11, Bullock teaches a microcontroller operative to sense a current in said secondary winding, and based on said current in said secondary winding, operate said shunt in a linear (see Bullock, column 17 lines 26-38) or switched regulation mode (see Bullock, column 17 lines 56-60).

Referring to claim 12, Bullock teaches that said switching regulator comprises a microcontroller (see Bullock, column 17 lines 61-63).

Referring to claim 13, Bullock teaches a detector operative to detect when said amplifier is unable to reduce said phase shift and ratio error by an expected amount (see Bullock, column 5 lines 35-42).

Referring to claim 14, Bullock teaches an indicator operative to indicate said detection (see Bullock, column 5 lines 35-42).

Referring to claim 15, Bullock teaches that said power supply circuitry is operative to provide power to a device external to said apparatus (see Bullock, column 1 lines 9-17).

Referring to claim 16, Bullock teaches a bridge rectifier coupled with said secondary winding and operative to provide a rectified output current from an output current of said secondary winding (see Bullock, column 18 lines 2-9); a shunt coupled with said bridge rectifier and operative to selectively shunt current from said secondary winding (see Bullock, column 7 lines 15-20); an energy storage device operative to receive a portion of said rectified output current that is not shunted by said shunt (see Bullock, column 18 line 2-9); a regulator operative to sense a voltage of said energy storage device and turn said shunt off when said voltage is below a first threshold and turn said shunt on when said voltage is above a second threshold (see Bullock, column 17 line 56 – column 18 line 9).

Referring to claim 17, Bullock teaches a comparator (see Bullock, column 10 lines 59-66).

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Referring to claim 18, Bullock teaches a microcontroller (see Bullock, column 17 lines 61-63).

Referring to claim 20, Bullock teaches that said voltage power said microcontroller (see Bullock, column 17 lines 61-66).

Referring to claim 21, Bullock teaches a MOSFET (see Bullock, column 17 lines 56-60).

Referring to claims 24 and 25, Bullock teaches a sense core and a secondary core; said sense core mounted within a groove formed in said secondary core (see Bullock, column 7 lines 45-52).

Referring to claim 26, Bullock teaches that active current transformer comprises said powering current transformer (see Bullock, column 7 lines 39-65).

Referring to claim 27, Bullock teaches that at least one of secondary leads and secondary terminals are configured for interconnection to an intelligent electronic device (see Bullock, column 10 line 68 – column 11 line 3).

Referring to claim 50, Bullock teaches that said first range is 4 kHz and below and said second range is 400 kHz and above (see Bullock, column 17 lines 39-44).

Referring to claim 51, Bullock teaches that said first range covers a frequency range at lower frequencies than said second range (see Bullock, column 17 lines 39-44).

Referring to claim 52, Bullock teaches that said at least one of secondary leads and secondary terminals are operative to deliver said scaled version of said current in the form of digital data (see Bullock, column 7 lines 39-44).

Referring to claim 53, Bullock teaches that said at least one of secondary leads and secondary terminals are operative to deliver said scaled version of said current in the form of a scaled current signal (see Bullock, column 7 lines 39-44).

Allowable Subject Matter

9. Claims 19, 22 and 23 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

10. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

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- (a) Alexander et al. teach an energy information management method for use with a circuit breaker.
- (b) Ehlers et al. teach an energy management and building automation system.
- (c) Adamiak et al. teach a digital current differential system.
- (d) Alexander et al. teach an energy information device and graphical display for a circuit breaker.
- (e) Adamiak et al. teach a method and system for consolidating phase current samples.


11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Mary Kate B. Baran whose telephone number is (571) 272-2211. The examiner can normally be reached on Monday - Friday from 9:00 am to 6:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Marc S. Hoff can be reached on (571) 272-2216. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

5 September 2005


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